PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 40935P/B600	**FOR FURTHER ACTION**	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US 01/ 01987	International filing date *(day/month/year)* 22/01/2001	(Earliest) Priority Date *(day/month/year)* 17/02/2000
Applicant BROADCOM CORPORATION		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
      ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :
      ☐ contained in the international application in written form.
      ☐ filed together with the international application in computer readable form.
      ☐ furnished subsequently to this Authority in written form.
      ☐ furnished subsequently to this Authority in computer readble form.
      ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
      ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).
3. ☐ **Unity of invention is lacking** (see Box II).
4. With regard to the **title**,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   ☐ the text is approved as submitted by the applicant.
   ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the **drawings** to be published with the abstract is Figure No. 5
   ☐ as suggested by the applicant.
   ☐ because the applicant failed to suggest a figure.
   ☒ because this figure better characterizes the invention.
   ☐ None of the figures.

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Form PCT/ISA/210 (first sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/01987

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

A ring oscillator circuit, such as a VCO, with a relatively high level of noise rejection for noise originating from both the voltage supply and ground. The ring oscillator circuit is composed of a plurality of differential delay circuits, each differential delay circuit generating a differential ouput signal that is a delayed (and preferably inverted) version of a differential input signal. Each differential delay circuit includes first and second input transistors for receiving the differential input signal. Each differential delay circuit also includes first and second load transistors coupled in parallel with the respective first and second input transistors. Each differential delay circuit further includes a first current source coupled between the first input transistor and a first power supply terminal (e.g., a voltage supply terminal), a second current source coupled between the second input transistor and the first power supply terminal and a third current source coupled between the first and second input transistors and a second power supply terminal (e.g., a ground terminal). The first and second current sources 525,526 reduce the coupling of noise from the first power supply terminal to the output. The third current source reduces the coupling of noise from the second power supply terminal VDO to the output. The third current source 527 reduces the coupling of noise from the second power supply terminal GNO to the output.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/01987

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H03K3/0231 H03K5/13 H03F3/45

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H03K H03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 994 968 A (MILLER GARY ET AL) 30 November 1999 (1999-11-30) column 6, line 22 - line 41; figure 6	1,13,14, 27,40
A	LEE S -J ET AL: "A FULLY INTEGRATED LOW-NOISE 1-GHZ FREQUENCY SYNTHESIZER DESIGN FORMOBILE COMMUNICATION APPLICATION" IEEE JOURNAL OF SOLID-STATE CIRCUITS,US,IEEE INC. NEW YORK, vol. 32, no. 5, 1 May 1997 (1997-05-01), pages 760-765, XP000698795 ISSN: 0018-9200 paragraph '000B!; figures 2,3	1,13,14, 27,40

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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search 9 May 2001	Date of mailing of the international search report 18/05/2001
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Feuer, F

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/01987

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 068 928 A (THOMSON CSF) 5 January 1983 (1983-01-05) column 3, line 15 -column 4, line 4; figures 1-3	1,13,14, 27,40

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 01/01987

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5994968 A	30-11-1999	NONE	
EP 0068928 A	05-01-1983	FR 2507338 A DE 3275901 D US 4417357 A	10-12-1982 07-05-1987 22-11-1983

Form PCT/ISA/210 (patent family annex) (July 1992)